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09/555,295	05/26/2000	ERICH GOTTWALD	P00.0760	3797

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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 07/15/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

B

Office Action Summary

Application No.

09/555,295

Applicant(s)

GOTTWALD, ERICH

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 1-23,25,37,38,40,42,44 and 46 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 is/are allowed.
- 6) ☐ Claim(s) 24,26-28,30-36,39,41,43,45 and 47-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 36, 39 and 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 36 recites the limitation "the plurality of pump signals" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 39 recites the limitation "the plurality of pump signals" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 43 recites the limitation "the plurality of pump signals" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 24, 26, 30, 34-35, 45, 47 and 49-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamane et al. (U.S. Patent 5,764,404).

Regarding claims 24, 34-35 and 45, Yamane et al. discusses WDM optical amplifier and summaries the functions and operations of the invention in col. 9, line 40-col. 10, line 67. In particular, Yamane et al. teaches in FIG. 15 a method for adjusting tilting of WDM signal. FIG. 15 comprises optical fiber 1, WDM filter 29 and photo-sensors 30 for measuring the signal level,

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and pump signal 2. The pump signal is controlled by a control circuit. When two or more signal levels change, the control circuit adjusts the pump signal power accordingly. If the input power levels do not change, the feedback mechanism keeps the power level at the output of optical coupler 7 constant.

Regarding claims 26, 30, 47 and 49-50, Yamane et al. discloses in col. 9, line 40-48 that the invention controls the total level of the optical output of the amplifier according to the number of optical signals of different wavelength. Accordingly, a receiver always receives each of the optical signals at a required level even if one of the optical signals is absent.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 27, 31, 33, 39, 41 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404).

FIG. 15 of Yamane et al. has been discussed above in regard to claims 24, 26, 30, 34-35, 45, 47 and 49. Regarding claims 27, 31, 33 and 48, the difference between FIG. 15 of Yamane et al. and the claimed invention is that FIG. 15 does not include another pump source. Yamane et al. teaches in col. 10, lines 42-54, FIG. 18 and FIG. 19 the use of multiple pump signals of different wavelengths to adjust the tilting. One of ordinary skill in the art would have been motivated to combine the various teaching of FIG. 18 and FIG. 19 with the optical amplifier of FIG. 15 because pump signals of different wavelengths give different characteristics to the amplifier, as described in col. 10, lines 43-60 of Yamane et al., therefore give better control to the tilting. Thus it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use multiple pump signals, as taught by FIG. 18 and FIG. 19 of Yamane et al., in the optical amplifier of FIG. 15 of Yamane et al. because multiple pump signals of different wavelengths give better control of the tilting.

Regarding claim 39, Yamane et al. teaches in FIG. 18 the injection of a plurality of pump signals at a transmission end of the optical conductor.

Regarding claim 41, Yamane et al. teaches in FIG. 19 the injection of one pump signal at a receiving end and one pump signal at a transmission end of the optical conductor.

10. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Inagaki et al. (U.S. Patent 5,745,283).

Yamane et al. has been discussed above in regard to claims 27, 31, 33, 39, 41 and 48. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not use a pump signal with a wavelength that is greater than a maximum wavelength of each of the transmission bands. Inagaki et al. teaches in col.4, lines 15-42 that a pump signal of wavelength 1.57 μm is preferable over a pump signal of wavelength 1.48 μm . One of ordinary skill in the art would have been motivated to combine the teaching of Inagaki et al. with the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the 1.48 μm pump signal with a 1.57 μm pump signal, as taught by Inagaki et al, in the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range.

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11. Claims 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Onaka et al. (U.S. Patent 6,067,187).

Yamane et al. has been discussed above in regard to claims 24, 26, 30, 34-35, 45, 47 and 49. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not adjust tilting at the receiving end of the optical conductor 1. Onaka et al. teaches in FIG. 13 an amplifier with flat tilting. Onaka et al. monitors and pumps at the receiving end of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Onaka et al. with the optical amplifier of Yamane et al. by monitoring and pumping at the receiving end to minimize tilting at the receiving end because tilting limits the amplification of the amplifier. With tilting, the high power wavelengths may cause saturation while the low power wavelengths do not receiving enough amplification. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor and control the tilting at the receiving end of the optical conductor, as taught by Onaka et al., in the optical amplifier of Yamane et al. because a minimal tilting allows the maximum amplification from the amplifier.

12. Claims 36 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Zanoni et al. (U.S. Patent 5,991,070).

Yamane et al. has been discussed above in regard to claims 24, 26, 30, 34-35, 45, 47 and 49. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not include a plurality of pump signals at the receiving end of the optical conductor. Yamane et al. does teach in FIG. 19 the injection of pump signals at both the transmission end and the receiving end as discussed above in regard to claims 27, 31, 33, 39, 41 and 48. Zanoni et al.

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further teaches in FIG. 3 that a plurality of pump signals can be injected at the receiving end and the transmission end. One of ordinary skill in the art would have been motivated to combine the teaching of Zanoni et al. with the modified optical amplifier of Yamane et al. because more pump signals give more accurate and flexible control of the tilting. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plurality of pump signals at the transmission end and the receiving end of the optical conductor, as taught by Zanoni et al., in the modified optical amplifier of Yamane et al. because multiple pump signals give more accurate and flexible control of the tilting.

13. Claim 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Chikuma et al. (U.S. Patent 6,055,093).

Yamane et al. has been discussed above in regard to claims 24, 26, 30, 34-35, 45, 47 and 49. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not include an amplifier at a transmitting portion. Chikuma et al. teaches in FIG. 3 an optical amplification apparatus with an amplifier at the receiving portion of the optical conductor and an amplifier at the transmitting portion of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Chikuma et al. with the optical amplifier of Yamane et al. because additional amplifiers further boost the signal level and allow the signal to be transmitted over a long distance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a transmitting portion with an amplifier to further boost the signal level, as taught by Chikuma et al., in the optical amplifier of Yamane et al. because a high signal level allows the signal to be transmitted over a long distance.

Allowable Subject Matter

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14. Claim 29 is allowed.

Response to Arguments

15. Applicant's arguments with respect to claims 24-28 and 30-51 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl
July 9, 2003


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600